



Crowded—but still a free ride. See page 7.

Quarterly

LOS ANGELES
COUNTY MUSEUM
SPRING 1955 VOL. 12 NO. 1

SCIENCE ISSUE

LOS ANGELES COUNTY MUSEUM

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The Davidson-Australian Expedition

During the Summer of 1954, the Los Angeles Museum was fortunate in being able to participate in a scientific expedition to Northeastern Australia.

Plans for this expedition began with a telephone call in September of 1953, when John B. Davidson of Corona del Mar asked if I would join him in making an ornithological expedition to Australia during the following year.

John B. Davidson, a friend of several years standing was born in New South Wales, Australia, but came to the United States at the age of 19. Settling in California, he became a very successful civil engineer. While a boy in Australia he had developed a keen interest in the rich bird life of that continent and throughout the years of his engineering career in America, this interest never diminished.

For several years prior to his retirement from the engineering profession, John Davidson had been planning to revisit his homeland and renew his study of the birds of Australia. I had long been aware of these plans, so John's announcement that he was now ready to put his dream into action did not come as a surprise—the surprise came with his request that I join him in his adventure and that we undertake the project as a well planned scientific expedition which would benefit the Los Angeles Museum. The museum readily accepted the proposal and the Davidson-Australian Expedition became a reality.

Following the acceptance of John Davidson's proposal in September, 1953, came months of planning and assembling of equipment. In consultation with Dr. Ernst Mayr of Harvard, one of the world's leading ornithologists and authority on the bird life of Australia, it was decided that the most worthwhile scientific contribution of the expedition could be made by concentrating on the distribution of bird life in the rain forest areas of Queensland between Brisbane and Townsville. According to Mayr, this area represented one of the least known regions of all Australia. Contact was made with government officials in Australia and the difficult negotiating for permits to collect birds and mammals for scientific purposes was initiated. John Davidson departed for Australia on the first of February, 1954, as he planned to spend several months visiting friends prior to my arrival in June. In due time the necessary permission was received from the states of New South Wales and Queensland to make collections of bird life for the museum. In April, 1954, the packing cases of heavy field equip-

ment departed for Sydney aboard the "S.S. Alameda" and on June 5, 1954, I followed by plane, arriving in Sydney 36 hours later.

Most persons have the general impression that Australia is a barren land, or, at the best, covered with a scattering of gum trees and grass, over which hop great numbers of kangaroos.



JOHN B. DAVIDSON, sponsor of the expedition



Heavy rain forest jungle in eastern Queensland. The bangalow palm, shown in the center foreground, is one of many species of palms occurring in these tropical forests.

Gum trees and grass it has, and kangaroos by the thousands; but there is a great deal more to this continent of the southern hemisphere than gum trees and kangaroos. Few persons suspect that on this supposedly dry continent grow luxuriant rain forest jungles—as lush and dense as anywhere else in the world.

In order to appreciate the magnitude and natural wonders of this great land it is first necessary to have a basic appreciation of the topographic features of the continent itself.

Australia, lacking only about 47,000 square miles of being as large as the United States, is a very old land mass, geologically speaking. The surface of the continent is worn down in old age with no recent upliftings or mountain building. The highest mountain in the entire continent has an elevation of only 7330 feet. The geographic center of Australia is an arid region comparable to our North American deserts. Surrounding this arid heart is a vast perimeter of grasslands and plains which radiate out for hundreds of miles on all sides.

Extending along the east coast of the continent from Victoria in the south to Queensland in the north is a great chain of low-lying mountains known as the Great Dividing Range. This offset mountainous backbone is literally the continental divide of Australia. The Dividing Range, although seldom exceeding 4000 feet in elevation, nevertheless is sufficiently high to act as a barrier to moisture-laden winds blowing in off the South Pacific Ocean. Consequently the greatest percentage of this moisture is deposited on the eastern slopes of the Dividing Range and results in the growth of luxuriant tropical rain forest along the northeastern coast of Australia. It was the extensive rain forests of Queensland, lying between Brisbane and Townsville, which

were to be the primary research area of the Davidson-Australia Expedition.

Arriving in Sydney on June 6, I was met by John Davidson and the expedition was officially underway. Our field equipment had arrived by boat a month earlier and we lost no time getting it in shape at our headquarters at the Australian Museum. Our transport consisted of a four-wheel drive British Land Rover, equipped with a light two-wheeled utility trailer. The Land Rover is comparable to our American jeep, but is slightly larger and rides more comfortably. Leaving Sydney on June 10, we rolled westward over the Great Dividing Range on the first leg of our 6000 mile trek which was to take us deep into the tropics during the next three months. Reaching the open forest and grass land area of interior New South Wales, we turned northward towards Queensland and a climate which we hoped would be balmier than the wintry weather of southern New South Wales. During the days that followed, we progressed northward through an ornithologist's paradise, swarming with flock upon flock of brilliantly colored parakeets and cockatoos in infinite numbers.

Near the Queensland-New South Wales border we crossed the Dividing Range once more and descended to Brisbane in coastal sub-tropical Queensland. By the time we reached this capital city the



Young wombat held by the author. This animal is the pet of the daughter of David Fleay, one of Australia's leading naturalists. The wombat, a large rodent-like marsupial reaches a weight of approximately 200 lbs. when fully mature.



A pair of Koalas at the Koala sanctuary located at Indooroopilly, a suburb of Brisbane, Queensland. Approximately 100 individuals of this interesting species are living in this sanctuary.

Land Rover was bulging with specimens and provision was made to store them at the Queensland Museum.

From Brisbane we headed westward with our objective being the Carnarvon Range—a remote and little known wilderness area into which few biologists had ever set foot. The Carnarvon Range, lying nearly 350 miles inland from the coast, was reported to harbor an isolated tract of rain forest. If this condition were found to be true, it would be of real ornithological interest to study the bird life found there.

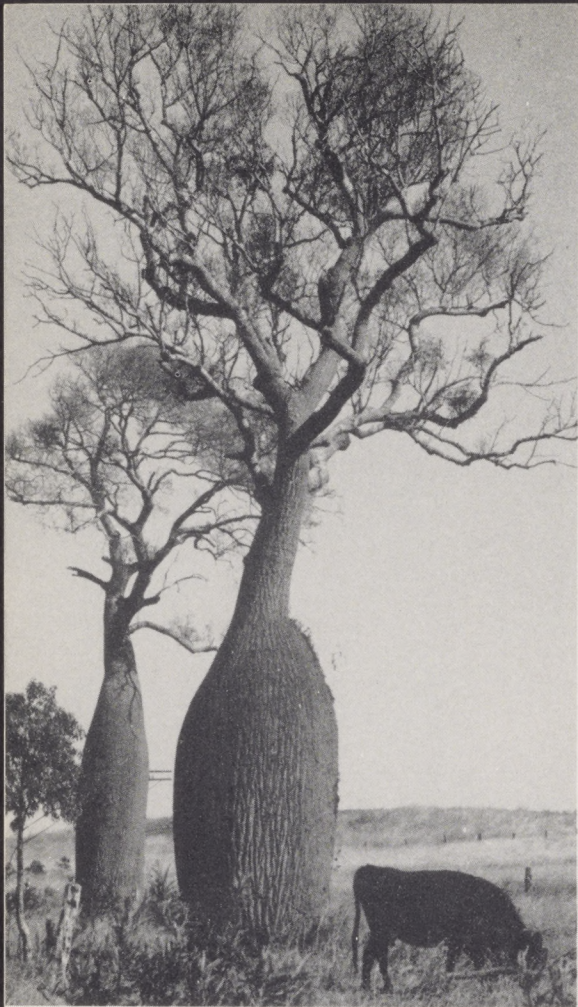
On July 2 a base camp was established in the Wallaroo Gorge of the Carnarvon Range. The isolated rain forest for which we had been searching was located within the deep walls of the Wallaroo Gorge and with its discovery the serious work of the expedition began. It was here that John Lawson, an Australian ornithologist, joined our field party. John had originally intended to be with us only during the Carnarvon investigation but, fortunately for the expedition, he was able to remain with us throughout the period of field work in Australia. Lawson proved to be an excellent field man and a congenial companion.

The time and effort expended in the remote Carnarvons was well spent and an excellent collection of bird specimens was assembled.

During the period we were in the Carnarvon Range a cyclonic storm from off the South Pacific hit the Queensland coast and caused an unprecedented rainfall. Over twenty inches of rain fell in some of the coastal areas, but the Carnarvons received only between two and three inches. Even this amount was troublesome to the expedition, as we were living in tents. Our real difficulties with the storm, however, began when we attempted to return to Brisbane. Southeast of the Carnarvon Range we found all of the river courses flooding their banks, with the roads and bridges as much as twenty feet under water in many areas. At Roma we would have been delayed three weeks had we waited for the highway to clear. With the aid of Australian friends, however, we were able to get our vehicles aboard the first freight train crossing the inundated area and managed to reach the coast



A large varanid lizard, or "Goana," which occurs abundantly throughout many parts of Australia. Goanas often reach a length of four or five feet and will generally live in holes of trees. Climbing trees as they do, they prey rather extensively on the eggs of nesting birds.



The Queensland Bottle tree (*Brachychiton*), a strange species found in many areas of Australia. The trees are frequently left standing when the land is cleared, as the swollen trunk consists of a moist pulp which can be utilized for cattle food in times of drought.

without too much loss of valuable time. The train trip required twenty-four hours to cross 180 miles of flood land, as each trestle had to be inspected and flood debris cleared from the tracks. High ground was reached 100 miles west of Brisbane and the vehicles were removed from their flat cars. From this point on a dry road led into the city and no further time was lost. The return to Brisbane marked the conclusion of the first phase of the expedition and the beginning of the second and major objective of our field plan. From Brisbane we proposed to travel rapidly northward along the Queensland coast to the city of Townsville, noting likely-looking study and collecting areas en route. At Townsville we would then turn south once again and slowly retrace our route, stopping off for periods of time at the most desirable locations. The large tracts of coastal rain forest jungle were the areas with which we were most concerned, as no museum in the world was known to possess satisfactory collections of birds from this general region.

While at the Australian Museum in Sydney during early June, we had made arrangements for the loan of the services of a preparator for this second phase of field work. It had been arranged that Mr. Colin Swinfield would join us in Brisbane and assist in the preparation of bird specimens collected during the trip to Townsville.

On July 19, young Swinfield arrived in Brisbane by plane from Sydney and with our field party now enlarged to four persons the expedition headed northward on the following day.

Although we travelled as rapidly as possible, our progress was continually impeded by interesting species of birds that crossed our path, or were noted along the roadside. Whenever this frequent occurrence took place, the vehicles would grind to a halt, collecting guns would be unsheathed, and the

The nest mound of a mound builder or Scrub turkey. These large turkey-like birds scratch up mounds such as this and deposit their eggs in the center. The heat from the decaying vegetation incubates the eggs with no further help from the parent birds. Upon hatching, the young chicks dig their way out of the debris unassisted. The mound shown here has a base measuring twenty feet in diameter.





Expedition camp in the Wallaroo Gorge of the Carnarvon Range, Queensland. The camp is situated in a forest of *Eucalyptus* known as Ironbarks. The isolated tract of rain forest mentioned in the text is located close to this camp site.



A scene from the flooded area of Queensland through which the expedition had to travel in order to reach the coast.

search for the desirable species begun. Consequently our day's progress was frequently measured in numbers of birds collected rather than miles travelled. By the end of each day, a sizable number of bird specimens had been collected and were awaiting preparation.

Rather than waste valuable time in setting up camp we would frequently reach a small town by evening and if possible book rooms at the local "pub." The country hotels of Australia leave a lot to be desired insofar as comfort and facilities are concerned, as they most generally consist of a few sleeping rooms above the local pub or saloon. Once accommodations for the night had been secured a regular work procedure was followed. While other members of the field party were unloading personal effects and specimen preservation gear, one member would check the type of electric power supply in the hotel. The country hotels for the most part furnish their own power from a generating plant located in the back of the hotel and the voltage varies with different hotels. The light bulbs in the rooms were usually of such low wattage that it was necessary to replace them with larger bulbs in order to insure ample light for skinning specimens. To meet this problem we carried a wide variety of light bulbs in the Land Rover. Thus insured of proper light, the necessary task of bird skin preparation would continue until one or two o'clock in the morning. When all specimens had been prepared and field notes completed, we could then

think of sleep. Up again at dawn, the expedition was soon on the road and the whole procedure repeated day after day.

Scientific field work such as this requires a rigid and often grueling pace, but the rewards for the efforts are many and varied. Although the nights were filled with detailed and time-consuming specimen preparation, the days were an unending series of new experiences and glimpses of a strange and wonderful land. Nowhere else in the world is it possible to have kangaroos and wallabies bounce across the road in front of you, or to have great flocks of brilliantly colored cockatoos and parakeets rise into the air from the roadside, or block your progress as they waddle off the road in front of your vehicle. Occasionally it was even necessary to stop and rescue large pythons which were found stretched out in the middle of the road and in danger of being run over by a careless motorist. These large, but harmless, snakes are protected in most parts of Australia because of their beneficial rat and rabbit-eating habits.

Wherever we travelled we were met by a friendly and hospitable people. Always eager to help us in whatever way they could, the wonderful people of Queensland went out of their way to make our Australian journey pleasant and memorable. Sometimes it was only a halt to share a cup of "billy tea" on a lonely homestead, or a glass of good cold beer in a local village pub. On one occasion, however, this famous "Queensland hospitality" manifested



The Queensland house turned over to the expedition by Mr. Leahy. This type of construction is typical of Queensland as the pilings or "stumps" protect the structure from termites and occasional high water. The tin roof traps all available rain water which drains to tanks in back.

itself in the form of a whole house placed at our disposal, a hundred or more square miles of private land upon which to collect, food for several days, and other kindnesses too numerous to mention. All of this from a generous gentleman by the name of John Leahy in the famous Darling Downs country of southern Queensland.

The only disturbing factor in our whole Australian adventure was the rapidity with which the

time flew by. There was so much we wanted to accomplish and see and the three short months passed much too quickly. Upon the completion of the Brisbane-Townsville circuit, the expedition returned once more to Brisbane. Mr. Swinfield had contracted to remain with us only for the above phase of work and returned to his duties at the Australian Museum in Sydney.

With our work completed in Queensland, the

A specimen of the large fruit bat or "flying fox" which occurs in great numbers along the east coast of tropical Australia. These large bats are capable of doing considerable damage to fruit crops as they feed only on ripening fruit. Bat is being held by our young Australian assistant, Mr. Colin Swinfield.





Kangaroo country near Collarenebri, Northern New South Wales. Scene is from Franxton station where the habitat group of giant red kangaroos was collected. Trees are *Acacia*, *Eucalyptus* and *Casuarina*.

fine collection of between four and five hundred bird specimens was packed, export permits secured, and the collection was dispatched by air to Sydney, to await our arrival a few weeks hence.

Attention was now directed towards the last phase of our activities. Our final effort was the collection of a habitat group of the giant red kangaroo for future display at the museum. John Lawson suggested that we travel southwestward into northern New South Wales, where from experience he knew that we would find great numbers of these large interesting animals. Acting upon John's advice, we moved our base of operations to the vicinity of Collarenebri, a vast sheep grazing area in northern New South Wales. Camp was made on Franxton station, a large sheep property owned by a very hospitable grazier by the name of Henry Morse. In the days that followed, Mr. and Mrs. Morse demonstrated most conclusively that Australian hospitality is not confined solely to Queensland, but is also found in ample measure in New South Wales. Mr. Morse's property proved to be literally hopping with kangaroos and a selection of very fine group specimens was made. With hundreds of animals to pick from, we were able to collect a fine large male red kangaroo or "boomer," a beautiful doe or "blue flyer," with a large youngster or "joey" in her pouch. To round out the group a weaned "joey" was added. Young kangaroos like to ride about in the mother's pouch as long as possible. The picture on the cover demonstrates the problem which besets a young kangaroo when it begins to outgrow its fur-lined home. When tail and feet can no longer be fitted into the pouch it is time for "joey" to get out and walk.

In addition to hours of careful labor needed to prepare the skins of the collected kangaroos, a great deal of time also had to be given over to a thorough documentation of the native scene by means of color and black and white photographs. It was also necessary to make a collection of plant samples and careful notes as to the kangaroo's habitat, as it would be depicted in the final exhibit thousands of miles away and months later in the Los Angeles Museum. A flock of fourteen beautiful rose-breasted cockatoos were also obtained to give a dash of bright color to the group.

With the material for the kangaroo group complete, came the sad realization that my rich experience in the unique land down under was rapidly drawing to an end and that I would soon be leaving this friendly country.

The return trip to Sydney was made without further delay and the field party reached the Australian Museum on September 3. Specimens and equipment were carefully packed, the five hundred bird specimens to accompany me by plane to Los Angeles and the large items such as kangaroos and eagles to come by boat with the tents, guns and other heavy items of expedition gear. John Davidson planned to remain in Australia for a considerably longer length of time in order to continue the collection of bird material in Western Australia and to see more of the vast land of his birth.

The expedition had been completely successful in every respect except that the time allotted had passed much too swiftly. John Davidson and John Lawson had proved the finest of companions under the most trying of conditions. It was therefore with real regret that I bid them both goodbye on September 7 and as the giant Pan American Clipper rose above the Sydney harbor and headed towards the Fiji Islands and home, I thought of the wish expressed by John Lawson, as he presented me with an Australian boomerang—that I, like a boomerang, would someday return to the Australia which was fast disappearing below.

Kenneth E. Stager
Curator of Birds and Mammals

Fossil Plants In The La Brea Deposits



The great wealth of animal remains found in the Pleistocene deposits of Rancho La Brea is well known and has no parallel among the many records of the past life of the earth. The unusual variety of species, the spectacular size of some of these skeletal remains found in the asphalt matrix, and their fine state of preservation so occupied the attention of the paleontologists involved in the excavations that little heed was given to the fossil plants associated with them.

Field notes on the work of excavating the fossils from the Rancho La Brea deposits by the Los Angeles County Museum, July, 1913 to September, 1915, reveal many interesting facts—the hardships and inconveniences they endured, their feelings of frustration when their supports would give way and the sides of their deep pits would cave in following heavy rains, and their disappointments in not finding fossil remains in a number of pits they dug. But, more than that, at least to a botanist, these notes reveal the many instances where they encountered an abundance of fossil plant material deposited with the skeletal remains in a number of these pits.

Nearly 100 excavations were made by the Los Angeles County Museum on the tract of land, approximately 23 acres, in which the now famous fossil beds occur (for a full account of the history of the Rancho La Brea deposits see Los Angeles

Tree trunk from Pit No. 3, which was found rooted in clay beneath the asphalt, 12 feet below the present surface of the ground.

County Museum Science Series No. 13 and *Quarterly*, vol. 10, No. 2). Of this number, 35 of the excavations revealed skeletal deposits in varying amounts. Some of these pits held only a few bones, some contained skeletal material so near the surface as to be considered of recent deposition, still others contained fossil bones that were so soft and friable, or nearly disintegrated, as to make preservation and study impossible. However, 14 of these excavations contained animal bones in such great quantities and of an array of species as to provide ample material for study and research for many years to come.

In many of these 14 important pits, fossil plant material was encountered in such tremendous masses as to make excavation difficult. Perhaps the most interesting of these was Pit No. 3 which was located at the N.E. corner of the pond. As the excavators got down below the 4 1/2-foot depth, there became exposed what appeared to be a stump of a tree. When they progressed down to 8 feet there appeared a large branch of almost the same diameter as the trunk and leading off at right angles to it. Then as they got down to 12 feet below the surface they found that the trunk of this tree was rooted in clay of what appeared to be a bank at the edge of a gully. Around this tree stump bones were "packed like sardines" in the matrix. No bones were found, however, in the clay soil under the roots. In order to remove the tree trunk, numerous roots as well as many branches, which were tangled with the bones, had to be cut off. A second tree trunk was found in another section of this same pit. This one occurred below 18 feet; its position was inverted and within its crotch there was an upright 4-foot section of a log which was thought to belong to the same tree. In still another section, below 8 feet, a quantity of brush and leaves was found in the matrix, concentrated in abundance along the line of contact with the clay walls which marked the limits of the deposit of asphalt. It was especially noted, also, that where the bones came in contact with masses of plant material the bones were badly decayed even though the wood material was firm or undecayed.

In Pit No. 4, at about 12 1/2 feet, quantities of brush and chunks of wood were found in one section, and numerous seeds "resembling those of the apple" were uncovered below 4 feet. In other sections quantities of leaves were found below 5 feet. As the excavators dug down to the depth of 15 feet they found that the quantities of brush increased and that the brush gradually replaced the bones at 16 feet.

Pit No. 9 is another deposit that was not only very remarkable because of the great number of mastodon and elephant skeletons that were found in it, but interesting, botanically because throughout nearly the whole width and depth (35 feet) of

the entire pit, wood, twigs, leaves and brush were found. A section of a tree, 12 inches in diameter and 7 feet long, was uncovered at the 19-foot depth. It was the second largest trunk removed from any pit in the Rancho La Brea deposits.

One other pit stands out as being especially interesting. In Pit No. 61, a pocket of small seeds "like those of mustard in size and shape" were uncovered at a depth of 17 1/2 feet. There was nearly a half pint of these in an area of not more than a cube of six inches, and the bulk of them was in a solid mass. One wonders how these tiny seeds could be deposited at this depth en masse. If they had been washed in or came in with drift material they could not have been deposited in a pocket exclusive of other material occurring as drift. Perhaps this pocket of seeds was the remains of a meal eaten by some bird or mammal shortly before it was trapped in the pit. Then, as the animal disintegrated, the contents of its crop or stomach—these seeds—were deposited in situ.

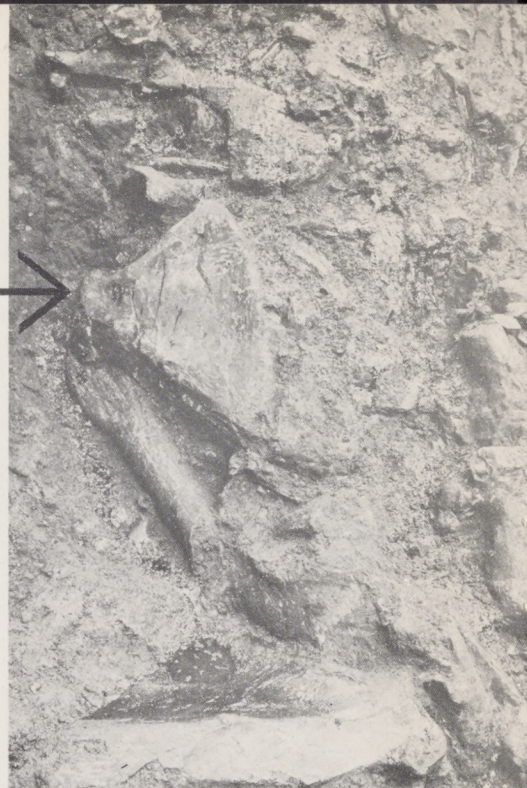
The field notes also revealed that two of the pits contained only plant material, while twelve others were reported to have fossil plant material,



Another stump of a tree, shown here as it was uncovered in the matrix of Pit No. 3 at the 18-foot depth, its position inverted. A section of log is seen resting in the crotch of two branches.



Two cones, believed to be of Bishop Pine (*Pinus muricata*), were uncovered in Pit No. 9. One was found embedded in the socket of the elephant scapula shown here in place in the matrix 12½ feet below the surface.



usually in great abundance, deposited along with the bones. Four additional pits, which have not been reported as containing plant material, will be added to this number as a result of our recent searching their matrices for plant fossils.

The Museum's studies of the smaller fossil material in the matrix from Rancho La Brea was started in 1942. The late Dr. Chester Stock, former Chief of Science at the Museum, asked Dr. W. Dwight Pierce, Curator of Entomology (now retired), to identify some large beetles and other insects that were collected in several of the deposits. From this material, Dr. Pierce was convinced that more insect fossils would be found if the matrix from these pits could be carefully examined. He, then began the slow and tedious process of extracting the tar from the matrix which was removed from inside the skulls of the Sabre-tooth Cats, and that adhering to other bones. In this material he not only discovered many fossil insects but recovered many seeds, leaf fragments, and

twigs. Some of the seeds were found inside the cavities of beetle bodies.

Quantities of seeds, twigs, and leaf fragments have been recovered thus far. The writer has been occupied for some time with the monumental task of sorting this fossil plant material and classifying the seeds. The material from Pit A was the first to be worked on because of its greater abundance. Thus far, there have been 16 distinctly different groups of seeds segregated, which represent about as many different species of plants. From this, one can realize how greatly our knowledge of the Pleistocene flora of this area will be increased when just the seeds from all the other pits are sorted and studied.

The University of California, which carried on explorations at Rancho La Brea at intervals from 1906 to 1913, has reported on the identification of a few species of plants. These preliminary identifications, made by F. H. Frost in 1927 and based, in part, on some of the Museum's material, are as

Second cone of Bishop Pine from Pit No. 9 (reduced approximately one-half natural size.)



Cone of Monterey Cypress (*Cupressus macrocarpa*) that was removed from the asphalt matrix in Pit No. 16.



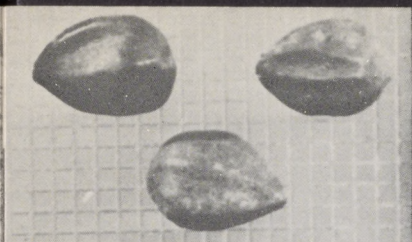


Figure 1.

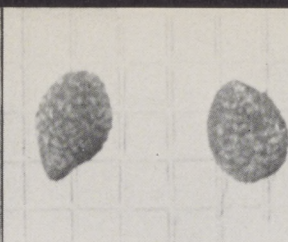


Figure 2.

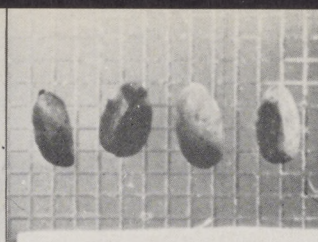


Figure 3.

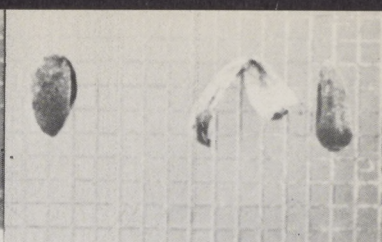


Figure 4.

Seeds from Pit A. The grid illustrated in these pictures is composed of millimeter squares.

follows: 2 cones which he refers to the Knob-cone Pine (but which Dr. Herbert L. Mason considers to be Bishop Pine), 1 cone of the Monterey Cypress, wood of Juniper, wood, acorns and leaves of the Coast Live Oak, and wood of the Elderberry. Mr. Frost also reported a single seed of the Western Hackberry from the Museum material, but the writer has not found any seeds resembling those of this tree in the material thus far studied.

The pine cones came from Pit No. 9. One was uncovered at the 17-foot depth and the other was found in another section at 12½ feet under the surface, embedded in the socket of an elephant shoulder blade. The Monterey Cypress cone was found in material that had been removed from Pit No. 16. The depth was not recorded and cannot now be ascertained. In the leaf and twig material the writer has segregated from Pit A there are numerous specimens that resemble those of the Monterey Cypress. However, critical study of the leaf material has not yet been completed. Should this material prove to be Monterey Cypress, it would indicate the presence of the species in some abundance. In view of the present day very restricted range of this cypress, its abundant occurrence at Rancho La Brea would make this species a climatic indicator of decided value.

One of the interesting, and somewhat perplexing problems which is revealed from the paleobotanical material from Pit A is the occurrence of abundant seeds, (see Fig. 1) twigs and leaves of Juniper (*Juniperus californica*). Today there are no junipers occurring on this side of the San Gabriel Mountains. They grow in the interior slopes and mesas bordering the western Mohave and Colorado Deserts. How then, could this abundance of juniper material be deposited in this area? Could there have been, during the Pleistocene time, a large valley or wash connecting the La Brea area with that of the Antelope Valley area, where junipers abound today, in order to make it possible for flood waters to transport the juniper material to this region? We think that this is not probable. It is more likely that the climate during the Pleistocene time was such that it favored the growth of the juniper in the foothills on this side of the San Gabriels and the material washed down into the Rancho La Brea area. Parts of plants such as leaves, twigs, fruits and seeds can be carried for some distance by water following rains. Many of the plants represented by the material in these deposits did not, necessarily, live in the immediate area of the

pits but may have grown in the foothills nearby.

Several of the 16 different kinds of seeds from Pit A are illustrated here. Those shown in figure 2 appear to be of Elderberry (*Sambucus glauca*), although they bear resemblance, also, to seeds of *Oxalis* and of *Phacelia*. For the present it is believed that these are Elderberry seeds since wood from the La Brea pits has already been identified as being of this tree. But, to be certain, further, comparative studies will be necessary. In figure 3, the seeds may be those of a California Lilac (*Ceanothus*), or of a spurge, or of one of several other kinds of plants having similar seeds. Likewise, figure 4 shows seeds that belong to the Aster-Daisy-Sunflower (Compositae) family.

In the past, botanists have given very little attention to seed characters, placing the main emphasis on those of stem, leaf and flower in their description and identification of plants. Now, in order that we may be able to identify the seeds from the Rancho La Brea deposits, it will be necessary first to make a critical study of the seeds in the living California flora.

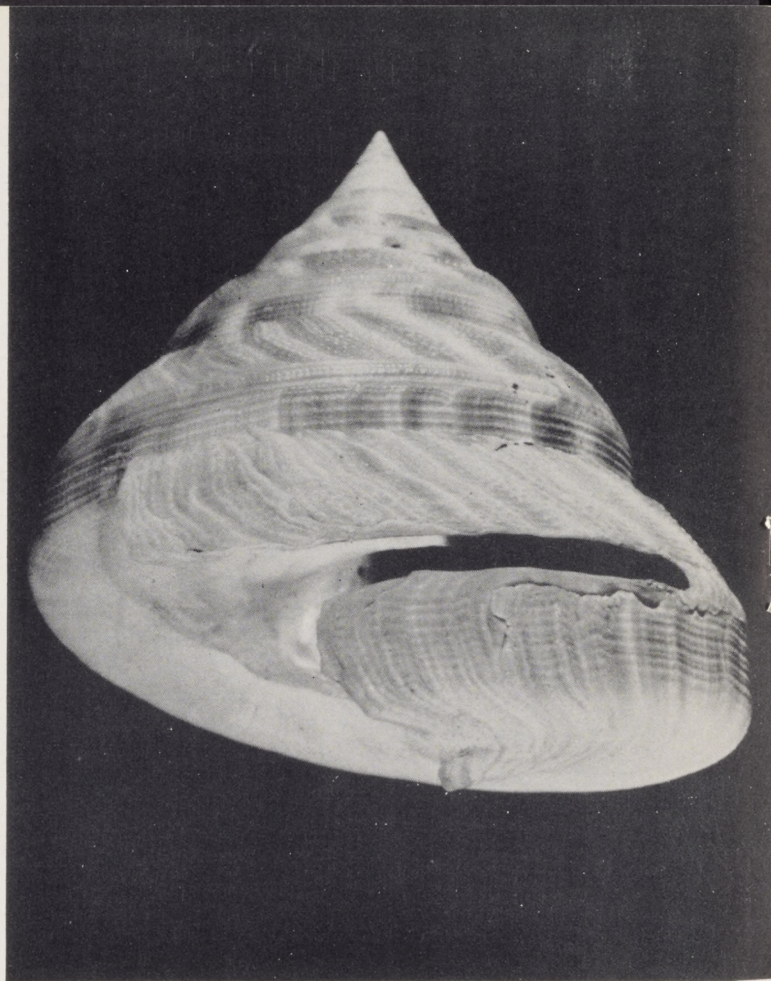
Various opinions have been voiced regarding the vegetation and the climate of Rancho La Brea in the past. These were based on the few identified plants and on the habits of the types of animals found in the deposits. From the conifer and oak material, the presence of a number of birds associated with wooded areas, and the browsing animals found, one could surmise that a forested or wooded condition existed not too far from the La Brea deposits. On the other hand, a preponderance of grazing animals found in the deposits would indicate that the immediate area was covered with a grassland type of vegetation.

Until all the fossil plant material from the Rancho La Brea deposits is identified, we can only hazard a guess as to the kind of vegetation that covered our area or as to what the climate was like. Because plants as a rule are sensitive to climatic conditions, they are excellent indicators of life zones. When these fossil plants are identified, we may be able to ascertain to a fair degree—based upon present day knowledge of the temperature and humidity requirements of the plants—the kind of vegetation and the climate that existed here during the Pleistocene period.

Bonnie C. Templeton
Curator of Botany



Thatcher's Wonder Snail



Slit-Side Shell

INTERESTING JAPANESE SHELLS

In the warm waters around the Japanese islands live many beautiful and interesting shell-bearing mollusks. Before World War II comparatively few of the shells could be seen in our museums or in the cabinets of private collectors. Since the war, due to the great expansion of the Japanese fishing industry, large numbers are taken in fishermen's nets. Enterprising businessmen have organized companies to gather, clean and sell these by-products of the fishing industry, so that today, beautiful Japanese shells have become more plentiful and can be obtained at reasonable cost.

The Los Angeles Museum has recently acquired a fine collection of Japanese marine shell specimens through purchase. A selection of the most outstanding specimens is on exhibition on the south

mezzanine. Among these, the following are worthy of particular notice:

THE WATERING POT

This is a mollusk that begins life with two tiny valves comprising the shell. As it grows, it secretes a tube and the two valves are embedded on the outer surface of the tube near the lower end. The full-grown tubular shell is three inches long with a perforated disk at the upper end.

THE SUN DIAL

A round, flattened shell several inches in diameter. The lower surface has a central umbilical opening lined with granules. The upper side is convex in shape and has brown-spotted spiral bands extending around the cream-colored whorls.

THE NOBLE PECTEN OR SCALLOP

This fan-shaped bivalve is three or four inches in diameter and varies greatly in color. Some are a delicate pink, some orange, some red, while others may be a beautiful, deep purple.

THE MAPLE LEAF

Shaped like a maple leaf, this univalve is frequently used as a pin ornament for women's coats. Brown in color and two inches in length, it makes an attractive piece of costume jewelry.

THE DENTALIUM OR TUSK SHELL

A white univalve shaped like a miniature elephant's tusk is open at both the large and the small end. Small species of tusk shells are found on the coast of California and were used by the early California Indians for money (wampum) and ornament. Specimens from Japan are the largest in the world and reach a length of five inches.

CARRIER SHELL

A tent-shaped mollusk which cements parts of other shells and bits of stone to its shell, along the upper surface. This serves as a camouflage, giving it the appearance of rubble.

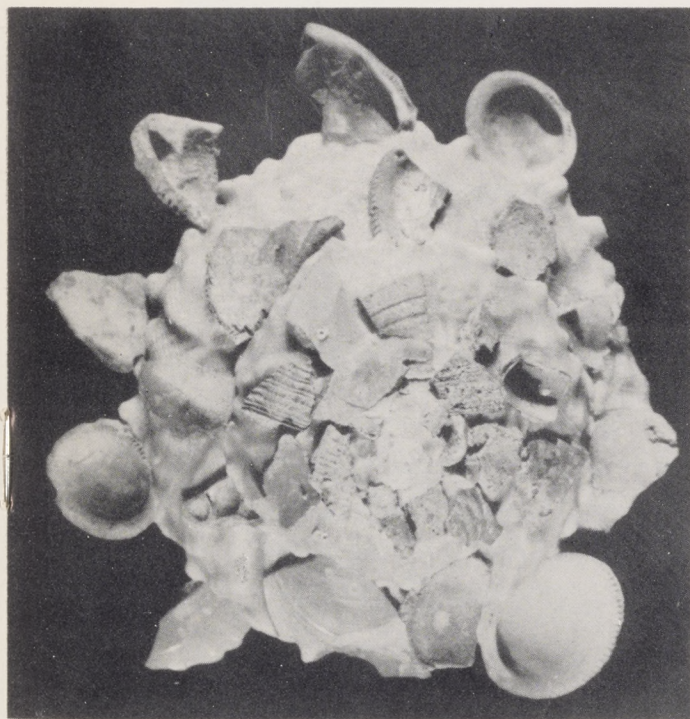
THATCHER'S WONDER SNAIL

This delicately sculptured univalve, four inches in length, looks as if it had been turned out on a lathe, or carved by human hands. It is not only beautiful but rare, and is only found in deep water off Japan.

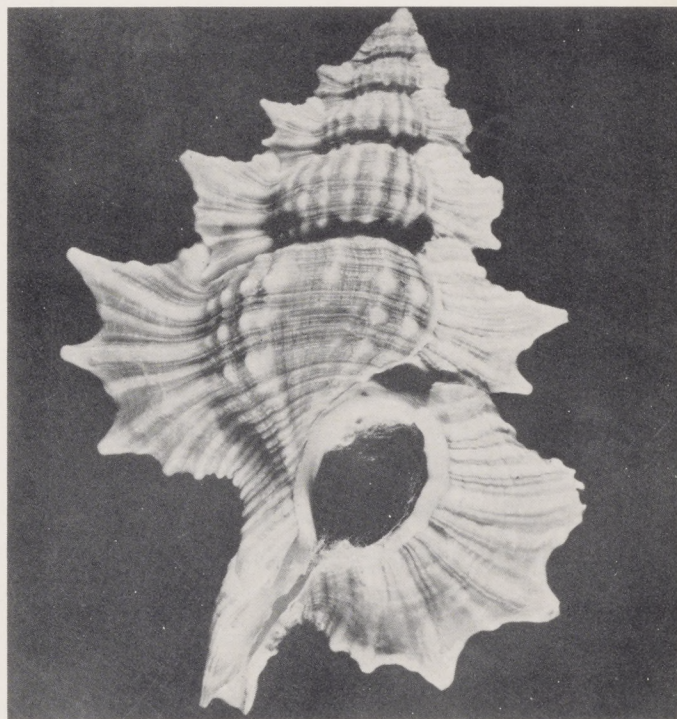
SLIT-SIDE SHELL

Another rare, deep-water shell that grows in a peculiar manner. A slit is left in the side as the shell grows and the slit cemented or closed behind as growth continues. The waste matter from the body of the mollusk passes to the exterior through the slit opening. Pink in color and top-shaped, the shell is about five inches in diameter across the base when full grown.

Howard R. Hill
Curator of Marine Zoology



Carrier Shell



Maple Leaf



BONES IN THE DESERT

(A Photographer Tells His Story In Pictures)

Late in 1953, Mr. Harley Garbani, a resident of San Jacinto, California, reported to the Museum his discovery of important fossil deposits in the Anza Desert State Park. This park, recently publicized for its unspoiled desert wilderness, (see *Sunset Magazine*, February, 1955) lies in San Diego County, southwest of the Salton Sea.

In June of the following year, Dr. Theodore Downs, Curator of Vertebrate Paleontology, having acquired the proper permits for prospecting on state property, organized a party of museum personnel to examine the deposits. I accompanied Dr. Downs and his assistant, Leonard Bessom, on this trip, as photographer. Later we were joined by two students, Steve Anderson and Ralph Compton.

Our first stopping place was Borrego where we had dinner. Proceeding on to Tamarisk Grove, we contacted the Park Supervisor, and spent the night in this public camp ground.



An early start the next morning brought us near the fossil beds well before noon. We encamped among the mesquite and iron wood trees on the north side of Vallecito Creek. Across the clearing was a spring with water trickling into an old horse trough. The trough was obviously very ancient, and it is not improbable that it had been used by the Butterfield Stage Coach Line in 1858, since this area was on the direct route of their run to San Diego.



The old Vallecito Stage Station is located just 19 miles south of the turn off from State Highway 78. It has been renovated and is preserved today as a point of interest to visitors in the area.



Dr. Downs and Mr. Bessom prospected the immediate area for fossils in the afternoon of the first day in camp, leaving the main objective across the ridge for the cool of the morning.

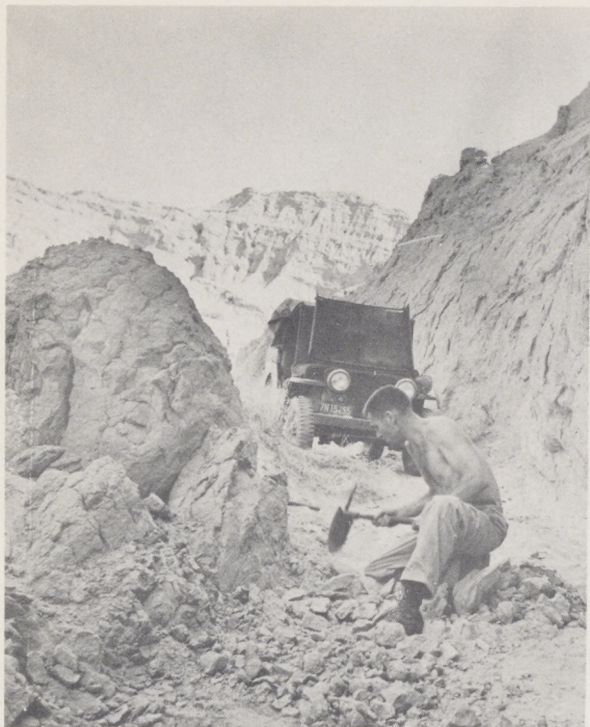
The following day Downs had the party up at 4 a.m., and by daybreak we reached the foot of the first ridge (about 5 miles by jeep). Everyone removed his equipment from the jeep; mine consisted only of a camera and a canteen, the others carried picks and knapsacks.



I soon found that I lacked two important essentials—boots and a pick. The paleontologist's pick serves two important functions beyond that of chipping out fossils—it carves footholds, and steadies you as you pull yourself up steep cliffs.

After a hard climb we reached the top of the ridge and Downs checked our location by compass and aerial photographs. Then we descended into the next wash, practically on top of the locality.





With the locality spotted, Bessom and I went back through the wash to bring in the jeep. This required a bit of widening of the wash here and there to let the jeep pass through the twisting stream bed, but we were back within the hour.



The fossil exposure occurred in tilted beds extending laterally 15 to 20 feet and showing a concentrated bone area in rocks which Downs identified as "green, fine-grained, calcareous silts and clays." The animals taken from this spot and surrounding areas he believes are of late Pliocene or early Pleistocene age, some one or two million years old. I photographed the locality from all angles and then assisted in the excavation of the fossils.

We knocked off work for the hottest hours of the day and drove back to camp where Bessom, with characteristic ingenuity, rigged up a shower by punching holes in a fruit can.



At 4:00 p.m. we were back at the locality, and completed the collecting for this trip. This particular locality contained many "microfossils"—the skeletal remains of rodents, rabbits, shrews and birds. In addition to the bones that were carefully removed in the field, four large sacks of matrix were collected and loaded in the jeep to be taken back and washed and screened in the museum laboratory in order to recover every bit of fossil material they might contain. Since this trip, Downs and Bessom have returned to the Anza Desert for extensive work throughout the area and have discovered bones of extinct antelope, horse, camel and mastodon.

On this preliminary trip, we accomplished several objectives including the collection of some interesting microfossils, photographs of the fossil strata and field activity, data on new localities, and an interesting story about hunting fossils!

Lewis H. Athon
Museum Photographer



RACCOON GROUP

Mr. Melville N. Lincoln, Senior Curator, announces the installation of a new group of California Raccoons. The group is a typical scene in the Sierra Madre Mountains.

Raccoons frequent much of southern California where there are trees and bushes. For the most part they are nocturnal, although occasionally they may be seen during the day. The young are born in April or May, and number from three to five. Raising of the youngsters is the full responsibility of the female.

It is interesting to note that those who worked on the group are all newcomers to the department of habitat groups. Mr. George N. Adams mounted the animals, Mr. Robert C. Clark painted the background and built the foreground, and Miss Eleanor Boehringer made the vegetation.

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Rancho La Brea. A Record of Pleistocene Life in California, <i>by Dr. Chester Stock</i>	.75
Fossil Birds, with Especial Reference to the Birds of Rancho La Brea, <i>by Dr. Hildegarde Howard</i> Revised edition available May, 1955. Price to be announced	
Quaternary Antelope Remains from a Cave Deposit in the Organ Mountains, New Mexico, <i>by Dr. Chester Stock</i>	.35
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